

iSHARES INVESTIGATES: ETF PRICE DISCOVERY

How ETFs contribute real-time price information to markets

Price discovery helps investors identify an actionable market price for a security or other instrument based on factors like supply and demand. Exchange-traded funds (ETFs) contribute to the price discovery process in two ways:

1. ETFs provide a way for investors to express their market views, thereby reflecting investor sentiment about risk and return
2. ETFs offer real-time access to markets and can help provide prices even when underlying markets are closed or hard to trade

Here we explore this price discovery mechanism and highlight instances when ETFs acted as price discovery tools for investors.

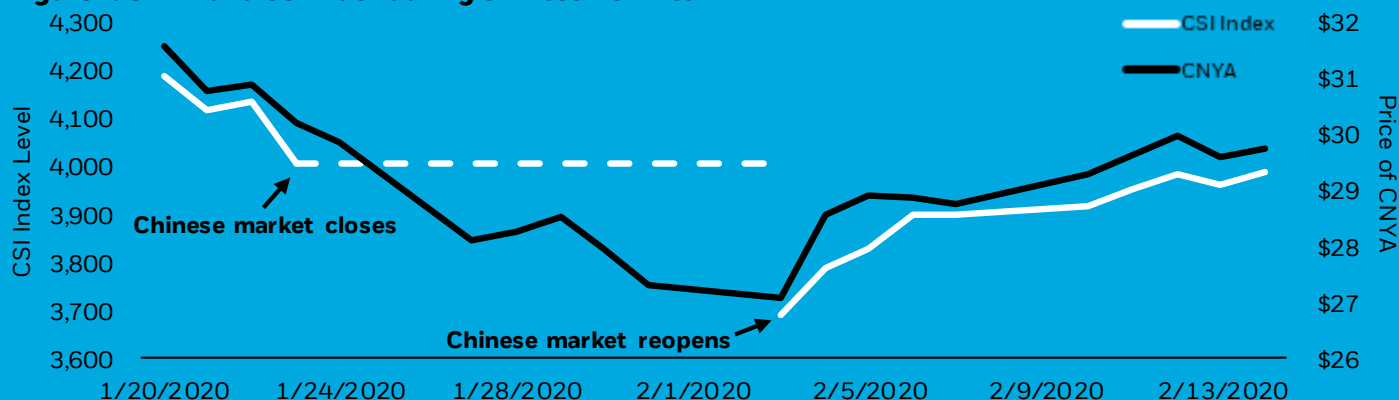
ETFs provide “off-hours” price guidance in international markets

Investors can use ETFs to get exposure to international markets even when the underlying markets are closed. Price formation in the ETF can also act as an indicator of where the underlying market may re-open.

In a striking recent example, when the market in China was closed for nine consecutive days during Chinese New Year, the iShares MSCI China A ETF (CNYA), a U.S.-listed ETF that seeks to track an index composed of domestic Chinese equities, acted as a price discovery tool.

Over the course of the holiday (January 23 to January 31, 2020), CNYA's price declined 9.6%.¹ On February 3, when Chinese stocks reopened, the CSI 300 index (which is designed to replicate the performance of the top 300 stocks traded on the Shanghai Stock Exchange and the Shenzhen Stock Exchange) opened with a decline of 9.1% for the same period—nearly identical to what CNYA had signaled (**Figure 1**).

Figure 1: CNYA and CSI Index during Chinese New Year²



Index performance is for illustrative purposes only. Index performance does not reflect any management fees, transaction costs or expenses. Indexes are unmanaged and one cannot invest directly in an index. Past performance does not guarantee future results. For standardized performance see the end of document

¹ Source: Bloomberg, BlackRock as of May 26, 2020 ² Source: Bloomberg, BlackRock as of May 26, 2020

Fixed income ETFs provide market transparency

ETFs trade on-exchange, which means their prices can move quickly to reflect prevailing market conditions. This added transparency is especially useful in opaque, over-the-counter fixed income markets where most bonds don't trade every day.

In March 2020, heightened market volatility made it more challenging and expensive to trade individual bonds. Instead, many investors turned to fixed income ETFs to express their views.

On March 16, one of the most volatile market days in recent history, shares of the iShares National Muni Bond ETF (MUB) traded at a 6% discount to the value of its underlying securities, or net asset value (NAV).³

What accounted for the difference in prices? MUB changed hands over 9,000 times on-exchange, while its top five holdings traded an average of two times apiece.⁴ The discount was not a “flaw” of the ETF wrapper; rather, MUB demonstrated a real-time, actionable price that investors were willing to pay for the basket of bonds based on current market conditions.

In fact, MUB's price was in line with the more actively traded bonds in its index (**Figure 2**), but the ETF allowed investors to execute the trade more quickly and easily than trading the underlying bonds.

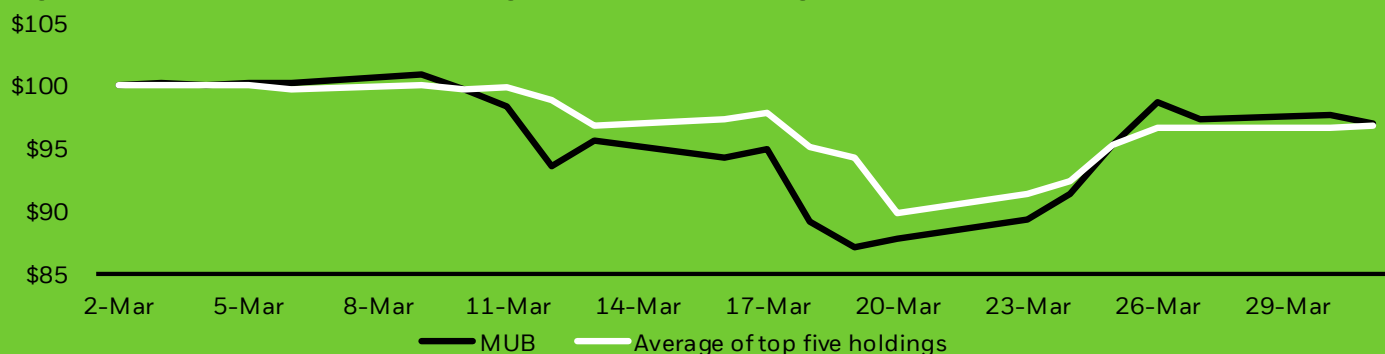
In other words, the ETF was acting as a leading indicator of prices in the bond market.

Fixed income ETFs have provided price discovery for their underlying bonds in other stressed market scenarios, too.

For example, on December 6, 2018—during a month of heavy bond selling—the iShares Floating Rate Bond ETF (FLOT) traded at a 6% discount to its NAV.⁵ The discount reflected a lack of liquidity in the underlying floating rate notes; indeed, just 23% of FLOT's 728 underlying bonds had traded the prior week.⁶

In this way, FLOT provided investors with real-time pricing information while the underlying bond market was impaired.

Figure 2: Price of MUB versus the average of its top five holdings in March 2020⁷



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Name	Weight in MUB ⁸
MTA NY 2036	0.19%
NYC Transitional 2037	0.18%
San Francisco Utilities 2042	0.17%
California University 2038	0.17%
California State 2043	0.16%

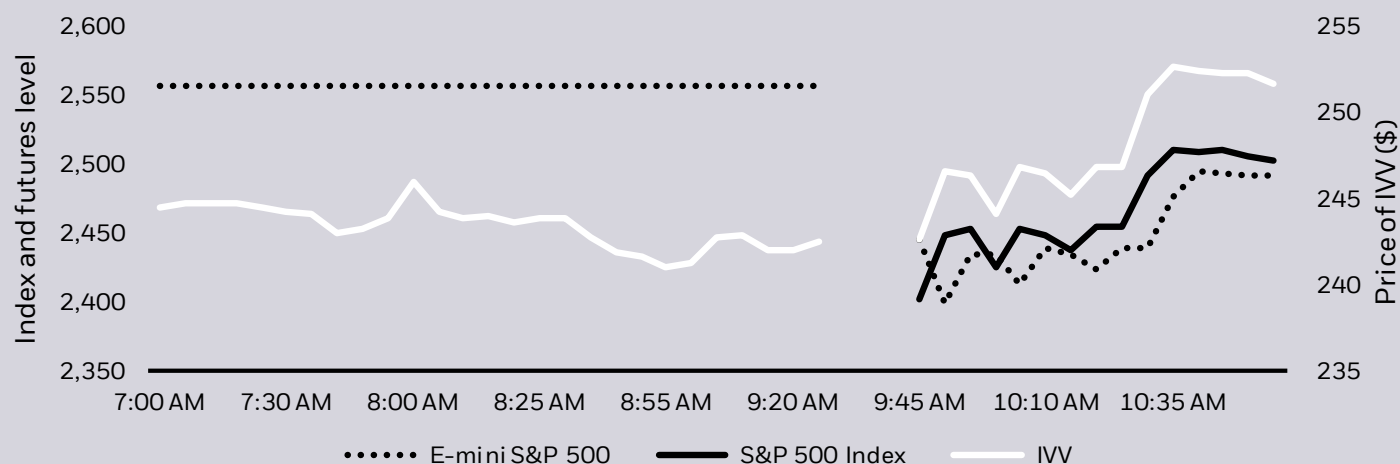
3 Source: Bloomberg, BlackRock as of May 26, 2020 **4** Source: Bloomberg, BlackRock as of May 26, 2020 **5** Source: Bloomberg, BlackRock as of May 26, 2020 **6** Source: Bloomberg; BlackRock, TRACE as of May 26, 2020 **7** Source: Bloomberg, BlackRock as of May 26, 2020 **8** Source: BlackRock as of March 30, 2020

Domestic equity ETFs can provide price discovery, too

Extreme equity market volatility in the first quarter of 2020 triggered trading halts on S&P 500 futures when they hit volatility guardrails that prevent them from trading at prices 5% above or below their previous day's closing price.

On March 16, an especially volatile day, the iShares Core S&P 500 ETF (IVV) provided pricing in pre-market trading while the futures were halted. With futures trading limited to a defined range, the pre-market price formation in IVV provided an estimate of where the S&P 500 index would open (**Figure 3**).⁹

Figure 3: S&P 500 instruments on March 16, 2020¹⁰



Gap represents 15 minute market-wide trading halt (09:30am -09:45am EST)¹¹

Past performance does not guarantee future results. For standardized performance see the end of document.

The bottom line

Price discovery is an important attribute of ETFs.

Fixed income ETFs can act as leading indicators of underlying bond prices, providing insight into the direction of fixed income markets. In some instances, ETFs may be the primary source of pricing information available to market participants (such as when underlying markets are closed or halted).

In all cases, we believe investors can benefit from the real-time price information that ETFs provide.

⁹ Source: Bloomberg, BlackRock as of May 26, 2020 ¹⁰ Source: Bloomberg, BlackRock as of May 26, 2020 ¹¹ A 7% drop in the S&P 500 index from the previous close triggers a "Level 1" Market Wide Circuit Breaker (MWCB). A Level 1 MWCB is an investor protection mechanism that triggers a 15-minute trading halt for all securities, futures, and listed options.

Fund Name: Fees as of Current Prospectus. All Other Data as of 09/30/20	Fund Inception Date	Gross Expense Ratio	30-Day SEC Yield (With / Without Waiver)	Contractual Fee Waiver Expiration (If Applicable)	1-Year	5-Year	10-Year	Since Inception
iShares National Muni Bond ETF	9/7/2007	0.07%	1.09%	--				
Fund NAV Total Return					3.67%	3.47%	3.52%	4.03%
Fund Market Price Total Return					3.89%	3.52%	3.54%	4.05%
Index Total Return					3.67%	3.70%	3.78%	4.19%
iShares MSCI China A ETF	6/13/2016	0.60%	1.26%	--				
Fund NAV Total Return					33.51%	--	--	12.07%
Fund Market Price Total Return					33.91%	--	--	12.21%
Index Total Return					33.95%	--	--	10.53%

Performance data represents past performance and does not guarantee future results. Investment return and principal value will fluctuate with market conditions and may be lower or higher when you sell your shares. Current performance may differ from the performance shown. For most recent month-end performance see www.iShares.com.

Shares of ETFs are bought and sold at market price (not NAV) and are not individually redeemed from the fund. Any applicable brokerage commissions will reduce returns. Beginning August 10, 2020, market price returns for BlackRock and iShares ETFs are calculated using the closing price and account for distributions from the fund. Prior to August 10, 2020, market price returns for BlackRock and iShares ETFs were calculated using the midpoint price and accounted for distributions from the fund. The midpoint is the average of the bid/ask prices at 4:00 PM ET (when NAV is normally determined for most ETFs). The returns shown do not represent the returns you would receive if you traded shares at other times.

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The iShares MSCI China A ETF (the "Fund") seeks to invest in A-shares through Stock Connect, a securities trading and clearing program that aims to provide stock access between the People's Republic of China and Hong Kong. Trading through Stock Connect is subject to a daily quota (the "Daily Quota"), which limits the maximum net purchases under Stock Connect each day, and as such, buy orders for A-shares would be rejected once the Daily Quota is exceeded. The A-shares market has a greater risk for market suspensions than other global markets. These risks may cause the Fund have higher tracking error and/or greater costs than other international investments.

Fixed income risks include interest-rate and credit risk. Typically, when interest rates rise, there is a corresponding decline in bond values. Credit risk refers to the possibility that the bond issuer will not be able to make principal and interest payments. Non-investment-grade debt securities (high-yield/junk bonds) may be subject to greater market fluctuations, risk of default or loss of income and principal than higher-rated securities.

There may be less information on the financial condition of municipal issuers than for public corporations. The market for municipal bonds may be less liquid than for taxable bonds. Some investors may be subject to federal or state income taxes or the Alternative Minimum Tax (AMT). Capital gains distributions, if any, are taxable.

Shares of iShares ETFs may be bought and sold throughout the day on the exchange through any brokerage account. Shares are not individually redeemable from the ETF, however, shares may be redeemed directly from an ETF by Authorized Participants, in very large creation/redemption units.

Although market makers will generally take advantage of differences between the NAV and the trading price of iShares ETF shares through arbitrage opportunities, there is no guarantee that they will do so.

Buying and selling shares of ETFs may result in brokerage commissions.

There can be no assurance that an active trading market for shares of an ETF will develop or be maintained.

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